

END TERM EXAMINATION

FIRST SEMESTER [B.TECH] DECEMBER 2025

Paper Code: ES-107

Subject: Electrical Science

Time: 3 Hours

Maximum Marks: 60

Note: Attempt all questions. Internal choice is indicated.

- Q1 Attempt **any four** of the following questions: (4x5=20)
- Define temperature coefficient of resistance? Explain effect of temperature on resistance? Define resistivity?
 - Define Power factor? What are the different type of power in ac circuits?
 - For the waveform shown in fig (1) calculate average value and rms value.

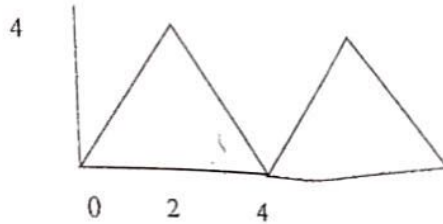
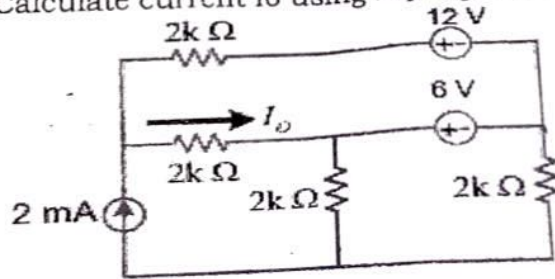


Fig.1

- Explain maximum power transfer theorem by considering resistive load in the circuit.
- Explain working of Dynamometer type wattmeter?
- What are the different types of three phase transformer connections?
- Write down working and applications of Auto Transformer.
- A coil of resistance 8 ohm and inductance 0.12 henry is connected in series across 230 V, 50Hz supply. Calculate: 1) Impedance of the circuit 2) current flowing through circuit 3) Power factor of the circuit 4) power drawn by the circuit.

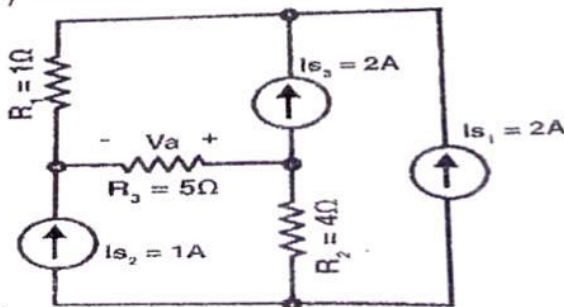
- Q2 (a) Calculate current I_D using super position theorem? (6)



- (b) State and explain Thevenin's theorem? (4)

OR

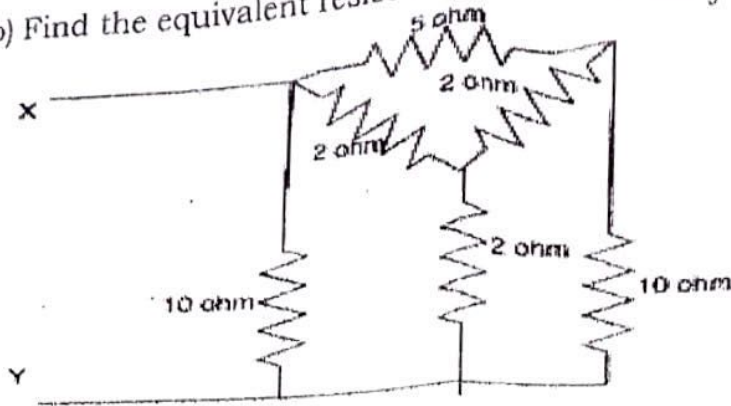
- Q3 (a) Calculate V_a using Nodal analysis? (5)



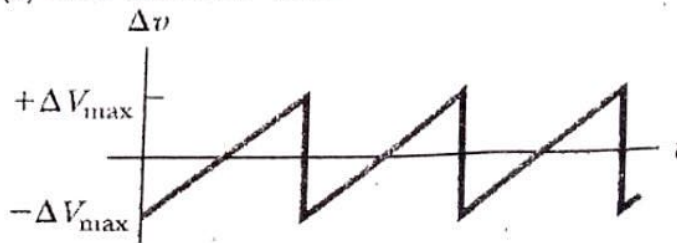
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(b) Find the equivalent resistance between x and y Terminal. (5)



Q4 (a) Find out RMS value of saw tooth waveform? (5)



(b) Explain resonance in series and parallel R-L-Circuit? Draw the resonance curve. (5)

OR

Q5 Drive the formula to calculate Power in three phase circuit. (10)

Q6 (a) Explain different type of speed control of DC shunt Motor? (5)
 (b) Derive the emf equation for generated voltage of Generator? (5)

OR

Q7 (a) What are the different types of AC three phase motor? Which type of motor is used for high starting torque? (5)
 (b) Write down application of Synchronous motor? Give its merits. (5)

Q8 (a) What are the different types of test conducted on transformer to find losses in the transformers? (5)
 (b) Define Voltage regulation? Draw the phasor diagram of transformer at inductive load? (5)

OR

Q9 (a) What are the different types of forces/Torques acting on Indicating instruments? (5)
 (b) Explain working principle of moving coil instruments. What are the advantages and disadvantages of moving coil instruments? (5)
